

WHAT IS CLAIMED IS:

1. A multi-component nonwoven fabric for use in disposable absorbent articles, said fabric comprising:

5 an upper, liquid-acceptance layer having an upper surface for receiving liquids introduced into said absorbent article, said upper layer comprising fibers selected from thermoplastic polymers, splittable thermoplastic fibers, or cellulosic fibers,

10 said upper surface of upper layer defining an array of upstanding projections extending above a network of liquid-accepting channels surrounding said upstanding projections; and

15 a next liquid-distribution layer juxtaposed to said upper layer, and hydroentangled therewith in liquid-transferring relationship for receiving liquid from said upper layer for distribution to said absorbent article,

20 said next layer comprising a blend of fibers including: (1) fibers selected from the group consisting of thermoplastic polymers, (2) profiled thermoplastic fibers, or (3) cellulosic fibers.

25 2. A multi-component nonwoven fabric in accordance with claim 1, including:

20 a lower liquid-retention layer juxtaposed to said liquid-distribution layer on the side thereof opposite said liquid-acceptance layer, said liquid-retention layer being hydroentangled in liquid-transferring relationship with said liquid-distribution layer, said liquid-retention layer at least partially comprising cellulosic fibers selected from the group consisting of wood pulp fibers, rayon fibers, and blends thereof.

25 3. A multi-component nonwoven fabric in accordance with claim 2, wherein:

20 said liquid-retention layer comprises a blend of said cellulosic fibers and thermoplastic polymer fibers having a denier of between about 6 and 18.

30 4. A multi-component nonwoven fabric in accordance with claim 3, wherein:

thermoplastic polymers are selected from the group consisting of polyolefins, polyesters, polyamides, and blends thereof.

5. A multi-component nonwoven fabric in accordance with claim 4, wherein:

polyolefins are selected from the group consisting of polypropylene, polyethylene, and blends thereof.

6. A multi-component nonwoven fabric in accordance with claim 4, wherein:

polyesters are selected from the group consisting of polyethylene terephthalate, polybutylene terephthalate, and blends thereof.

10 7. A multi-component nonwoven fabric in accordance with claim 4, wherein:

polyamide include nylon.

15 8. A multi-component nonwoven fabric in accordance with claim 2, wherein:

said next layer comprises a blend of fibers including: (1) fibers having a denier of about 6 to 18 selected from the group consisting of thermoplastic polymers, (2) profiled thermoplastic fibers, or (3) cellulosic fibers.

20 9. A multi-component nonwoven fabric in accordance with claim 1, wherein:

said liquid-distribution layer extends into said array of projections defined by the upper surface of said liquid-acceptance layer.

10. A multi-component nonwoven fabric in accordance with claim 2, wherein:

25 a lower surface of said liquid-retention layer, opposite said liquid-distribution layer, is surface-napped for enhanced loft.

11. A multi-component nonwoven fabric in accordance with claim 1, wherein:

30 said fabric defines a plurality of apertures extending from said network of liquid-accepting channels through said lower liquid-distribution layer.

12. A method of making a multi-component nonwoven fabric, comprising the steps of:

5 forming a layered precursor fibrous web including a first fibrous layer comprising fibers selected from the group consisting of polypropylene, polyester, polyethylene terephthalate, and nylon and having a basis weight between about 0.5 and 1.5 ounces/yd², and a second fibrous layer comprising a blend of fibers including (1) fibers having a denier of about 6 to 18 selected from the group consisting of polyolefins, polyesters, and polyamides, and (2) heat-fusible fiber, said second layer having a basis weight between about 0.5 and 10 1.0 ounces/yd²;

15 providing a three-dimensional image transfer device having a foraminous forming surface defining an array of surface depressions;

positioning said precursor fibrous web on said image transfer device with said first fibrous layer positioned adjacent said foraminous forming surface, and

15 hydroentangling said precursor web whereby said precursor web is imaged and patterned on said image transfer device, to thereby form a multi-component nonwoven fabric, said first fibrous layer forming a liquid-acceptance layer of said fabric having an array of upstanding projections extending above a network of liquid-accepting channels, said array of projections corresponding to said array of surface depressions defined by said foraminous forming surface, said second fibrous layer forming a liquid-distribution layer of said fabric juxtaposed to said liquid-acceptance layer and hydroentangled therewith in liquid-transferring relationship.

25 13. A method of making a multi-component nonwoven fabric in accordance with claim 8, including:

forming said precursor web with a third fibrous layer at least partially comprising cellulosic fibers selected from the group consisting of wood pulp fibers, rayon fibers, and blends thereof, said second fibrous layer being positioned between said first and third fibrous layers,

30 said hydroentangling step including forming said third fibrous layer as a liquid-retention layer of said fabric.

14. A method of making a multi-component nonwoven fabric in accordance with claim 9, including:

5 forming said third fibrous layer from a blend of said cellulosic fibers and fibers having a denier about 6 and 18 selected from the group consisting of polyesters, polyolefins, and polyamides fibers.

15. A method of making a multi-component nonwoven fabric in accordance with claim 9, including:

10 forming said liquid-acceptance layer with superabsorbent polymer therein.

15. A method of making a multi-component nonwoven fabric, including:

15 providing said superabsorbent polymer in a fibrous form in said third fibrous layer of said precursor web, and

20 drying said nonwoven fabric at an elevated temperature to activate said superabsorbent polymer.

17. A method of making a multi-component nonwoven fabric in accordance with claim 9, including:

25 surface napping said liquid-retention layer.

18. A method of making a multi-component nonwoven fabric in accordance with claim 8, including:

20 forming a plurality of apertures extending from said network of liquid-accepting channels through said liquid-acceptance and liquid-distribution layers.

19. A method of making a nonwoven fabric, comprising the steps of:

25 forming a precursor fibrous web having a cellulosic layer at least partially comprising cellulosic fibers selected from the group consisting of wood pulp fibers, rayon fibers, and blends thereof;

providing a three-dimensional image transfer device having a foraminous forming surface;

positioning said precursor fibrous web on said image transfer device; and

hydroentangling said precursor web whereby said precursor web is imaged and patterned to form said nonwoven fabric having an absorbent capacity, as a percentage of fabric weight, to thickness ratio of at least about 6.7.

20. A method of making a nonwoven fabric in accordance with claim 5 19, including:

forming said nonwoven fabric with superabsorbent polymer therein.

21. A method of making a nonwoven fabric in accordance with claim 19, including:

10 providing said superabsorbent polymer in a fibrous form in said precursor web, and

drying said nonwoven fabric at an elevated temperature to activate said superabsorbent polymer.

22. A method of making a nonwoven fabric in accordance with claim 15 19, including:

15 forming a layered precursor web including a first fibrous layer comprising fibers selected from the group consisting of polyolefins, polyesters, and polyamides, and a second fibrous layer comprising a blend of fibers including: (1) fibers selected from the group consisting of polyolefins, polyesters, and polyamides, and (2) heat-fusible fibers, said second fibrous layer being positioned between said first fibrous layer and said cellulosic layer,

20 said hydroentangling step acting to hydroentangle said layers in liquid-transferring relationship, whereby said first layer provides a liquid-acceptance layer of said fabric, said second layer provides a liquid-distribution layer of said fabric, and said cellulosic layer provides a liquid-retention layer of said fabric.

25 23. A method of making a nonwoven fabric in accordance with claim 19, including:

forming a surface of said liquid-acceptance layer with an array of upstanding projections extending above a network of liquid-accepting channels surrounding said projections.

30 24. A method of making a nonwoven fabric in accordance with claim 19, including:

surface-napping said nonwoven fabric to enhance the loft thereof.

25. A nonwoven fabric formed in accordance with the method of
claim 19.

26. A disposable absorbent article, comprising:
5 a multi-component nonwoven fabric; and
a liquid impermeable backsheet,
said nonwoven fabric comprising an upper, liquid-acceptance layer
having an upper surface for receiving liquids introduced into said absorbent
article, said upper layer comprising fibers selected from thermoplastic polymers,
10 pliable thermoplastic fibers, or cellulosic fibers, said upper surface of upper
layer defining an array of upstanding projections extending above a network of
liquid-accepting channels surrounding said upstanding projections, and a liquid-
distribution layer juxtaposed to said upper layer, and hydroentangled therewith
in liquid-transferring relationship for receiving liquid from said upper layer for
distribution to said absorbent article, said distribution layer extending into said
array of projections defined by the upper surface of said liquid-acceptance layer,
15 said liquid-distribution layer comprising a blend of fibers including: (1)
fibers selected from the group consisting of thermoplastic polymers, (2) profiled
thermoplastic fibers, or (3) cellulosic fibers.

20 27. A disposable absorbent article in accordance with claim 26,
including:

25 a lower liquid-retention layer juxtaposed to said liquid-distribution layer
on the side thereof opposite said liquid-acceptance layer, said liquid-retention
layer at least partially comprising cellulosic fibers selected from the group
consisting of wood pulp fibers, rayon fibers, and blends thereof.

28. A disposable absorbent article in accordance with claim 27,
wherein:

29. said liquid-retention layer is hydroentangled in liquid-transferring
relationship with said liquid-distribution layer.

30 29. A disposable absorbent article in accordance with claim 27,
wherein:

5 said liquid-retention layer includes superabsorbent polymeric material.

30. A disposable absorbent article in accordance with claim 26,

wherein:

5 said fabric defines a plurality of apertures extending from said network
of liquid-accepting channels through said lower liquid-distribution layer.